13. A system for providing management data describing synchronisation trail information for network elements in a communications network comprising a plurality of said network elements, comprising:

means for obtaining network element synchronisation data;

means for obtaining network element connectivity data; and

means for computing synchronisation trail information for said network elements from said synchronisation data and said connectivity data.

REMARKS

This paper responds to the Office action mailed 9 September, 2002 with reference to the above-identified application. By this response claims 3 and 4 are deleted. Claims 1, 5 and 6 are amended. New claims 7 to 13 are submitted for consideration by the Examiner. Claims 1-2 and 5 to 13 are in the application. No fee is due since there are fewer than 20 total claims, and two cancelled independent claims have been replaced by one.

Claims 1, 2 and 5 stand rejected under 35 USC §102 as being anticipated by Wolf (US6,081,550) and claim 6 stands rejected under 35 USC §103 as being unpatentable over Wolf in view of French et al (US6,330,601). These rejections are respectfully traversed.

The invention addresses the problem of deriving synchronisation trail information for a communications network. The applicants have addressed this issue in a novel and non-obvious way by computing synchronisation trail information from connectivity and synchronisation data. By computing synchronisation trail information according to the present invention as defined in claim 1 from the network element connectivity data and the network element synchronisation data, the generation of the synchronisation trail information can be automated.

Wolf teaches testing a synchronisation trail or clock trail of a network by applying physical tests to the network, specifically by modulating information on a reference

clock at a start of a clock path and observing the information at the network elements within the clock path (col 3, lines 13 to 15, col 4, lines 9 to 14). As described in col 3, lines 24 to 58, according to a first step of the test method of Wolf a first network element (NE1), (i.e. a network element fed directly by a Primary Reference Clock (PRC)), has information modulated on its reference clock and if the information is observed at the end of a clock path (at NE8) it can be concluded that an intact clock path exists between the first and last network element. According to a second step of the test method according to Wolf, the information modulated onto the first network element can be detected at each of the network elements in the clock path (col 4, lines 7 to 17). According to a third step according to Wolf, a clock path can be traced backwards from a selected network element by modulating information on successive network elements back along the path and detecting the information at the end element (col 4, lines 30 to 48 and col 4, line 61 to col 5, line 4).

Wolf does not disclose computing synchronisation trail information from network element synchronisation data and network element connectivity data and so Wolf does not anticipate the amended claim 1.

Wolf primarily teaches a method of physically testing a clock path in order to deduce whether the clock path is functioning. If an initial test shows that the clock path is not functioning as expected then additional testing is applied, dependent on the results of the initial test, to determine whether the network elements are adequately synchronised (see in particular, col 4, lines 15 to 18 and lines 25 to 29 and col 4 line 61 to col 5, line 4). This further testing may enable the existence of a modified clock path to be deduced. However, the teaching in Wolf, as set out at col 3, line 13 to col 5, line 4 assumes that the clock path to be tested is already known (see also col 3, lines 9 to 11). It is not stated in Wolf how the known pre-determined clock path is derived. Accordingly, Wolf does not teach how to compute a clock path or synchronisation trail. Nor does Wolf in any way teach that synchronisation trail information can be computed from network element connectivity data and network element synchronisation data, nor does it teach in any way how such information could be computed from such data. Wolf teaches a method of physically testing a

pre-determined clock path and of using the results of such testing to make deductions about a clock path. Wolf leads the reader away from the present invention by teaching that information about a clock path is to be obtained by the physical testing of that clock path.

With reference to claim 2, Wolf does not disclose or in any way teach a protocol having a timing layer for representing synchronisation trail information. Wolf teaches that deductions can be made about a pre-determined clock path or synchronisation trail by applying a physical test to a network. Wolf does not teach the existence of synchronisation information inherent in the network and so no timing layer for representing synchronisation trail information can be implied.

The same arguments as apply to claim 1 apply to claims 5 and 6.

With reference to claim 6, French et al provides an interface module for permitting a network management system to represent different levels or layers in a communication system. The teaching of French et al in combination with Wolf does not teach the computation of synchronisation trail information from network element connectivity data and network element synchronisation data available from the network and so does not lead to the present invention according to claim 6.

The new claims 7 to 12 relate to specific aspects of the computation defined in claim 1 and are dependent on claim 1.

The new claim 13 is an apparatus claim relating to a system for providing management data, and is submitted to be allowable for the same reasons expressed above.

Applicants have studied the prior art made of record and not relied on, and have come to the conclusion that this art does not prejudice the patentability of the invention as defined by the amended claims submitted herewith.

Given the above, it is submitted that this application, as amended, is now in condition for allowance, and such action is solicited.

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Version with Markings Showing Changes Made to Amended Claims

1. (Amended) In a communications network comprising a plurality of network elements, a method of providing management data describing synchronisation trail information for said network elements, said method comprising the steps of:

obtaining network element synchronisation data;

obtaining network element connectivity data; and

(deriving) computing synchronisation trail information for said network elements from said synchronisation data and said connectivity data.

5. (Amended) A method of exploring synchronisation trails within a network comprising a plurality of network elements, the method comprising the steps of:

obtaining network element synchronisation data;

obtaining network element connectivity data ; and

(deriving) computing synchronisation trail information for a network element and (following) the trail to the synchronisation source of the element, using said synchronisation data and said connectivity data.

6. (Amended) A method of displaying information relating to synchronisation trails within a network comprising a plurality of network elements, said method comprising:

obtaining network element synchronisation data;

obtaining network element connectivity data;

(deriving) computing synchronisation trail information for said network elements from said synchronisation data and said connectivity data; and

for each synchronisation trail, displaying in graphical form the synchronisation trail information from a network element and following the trail to the synchronisation source of the element.